

## PE SCREENING EVIDENCE WITH THE CRIME-LITE® ML2

### A. SCOPE

- A.1 The Crime-lite® ML2 has a number of high intensity forensic light sources and a magnifying lens. It can be used to examine evidentiary items for the presence of biological stains which may not be visible to the naked eye. Semen and saliva stains frequently fluoresce with the use of an alternate (visible or ultraviolet) light source; they can appear as a bright fluorescent area on a dark background or as a dark area when the background itself fluoresces. While most bloodstains can be detected with the naked eye, blood deposited on a dark colored item may be difficult to locate. The use of an alternate (ultra violet or infrared) light source can sometimes provide the contrast needed to locate bloodstains that are not readily visible otherwise.
- A.2 The Crime-lite® ML2 has two configurations. One is equipped with a white light source and an ultraviolet (UV) light source (with a 365 nm peak wavelength), a violet light source (with a 405 nm peak wavelength), and a blue light source (with a 445 nm peak wavelength). In addition, there are two fluorescence viewing filters, a yellow GG455 filter and a yellow GG495 filter. The intensity of the fluorescence emitted from biological staining is very weak relative to the intensity of the incident light. Therefore, it is necessary to observe this fluorescence through a viewing filter capable of screening out the incident light. Because UV fluorescence re-emits as visible blue light, use of a viewing filter is not necessary with an UV light source. The second configuration is equipped with a white light source and an infrared light source (with an 850 nm peak wavelength). The Crime-lite® ML2 light source(s) and viewing filter(s) used will depend on the kind of biological stain being screened for and also the surface on which the stain is deposited. It may be necessary to try multiple combinations of light sources and viewing filters to determine which combination is most suitable for a particular item of evidence

### B. QUALITY CONTROL

Not applicable

### C. SAFETY

- C.1 Treat all biological samples as potentially infectious. Gloves, a face mask, and a lab coat must be worn. Additionally, eye protection (e.g. safety glasses or a face shield) may be worn.
- C.2 Users and other observers of the Crime-lite® ML2 must not look directly into the light beam or at any direct reflection from a shiny surface; scattered excitation light constitutes an eye hazard to all unprotected individuals.
- C.3 In order to prevent eye damage, a viewing filter must be attached to the Crime-lite® ML2 during any fluorescence examination with the violet and blue light sources; there is a built in viewing filter in the Crime-lite® ML2 window that protects the user's eyes when the UV light

Document ID	Revision	Approval	Date Published
7139	8	Supervising Criminalist - Biology	7/24/2019 9:55:34 AM

source is used and the use of the camera and indirect observation on the computer monitor protects the user's eyes when the IR light source is used.

- C.4 During use of the Crime-lite® ML2 UV light source, exposure to unprotected skin must be minimized. Almost any form of covering including a lab coat and disposable gloves, will fully protect skin from injury.

#### **D. REAGENTS, STANDARDS AND CONTROLS**

- D.1 Bleach-based cleaner, e.g. Clorox Bleach Germicidal Cleaner (Decontamination)  
D.2 70% Reagent Alcohol (Decontamination)

#### **E. EQUIPMENT**

- E.1 Crime-lite® ML2  
E.2 Fluorescence viewing filters  
E.3 Camera  
E.4 Computer with image capture software  
E.5 Air filters

#### **F. PROCEDURES**

- F.1 All lights in the immediate area should be turned off when using the Crime-lite® ML2 UV, violet, and blue light sources to detect biological stains. The choice of lights off or on when using the Crime-lite® ML2 IR is user dependent and will vary due to background material and biological stain being sought. During use of the white light source, the laboratory lights may remain on.
- F.2 If the violet or blue light sources are being utilized, a fluorescence viewing filter must be in place. A viewing filter is optional for use with the UV light source. To attach a filter, engage the slots in the lower edge of the filter with the raised screws on the front of the magnifier head. Then place the top edge of the filter against the magnifier head so that it becomes magnetically attached.
- F.3 Activate the desired light source by depressing the appropriate button on the right side of the main unit. Either of the arrow buttons will switch on the white light source. The buttons labeled "420-470", "395-425", and "350-380" will switch on the blue, violet, and UV light sources, respectively. When a light source button is depressed an audible "chirp" will sound and the relevant indicator will be illuminated.
- F.4 If the UV light source button is depressed, the relevant indicator will blink until the key on the back of the main unit is turned horizontally. This key is a Crime-lite® ML2 safety feature so that examiners will not unknowingly be exposed to UV radiation.
- F.5 If the IR light source is being utilized, open the Crime-lite® camera icon on the computer desktop and select the appropriate options: "Device Settings" - Crime-lite® ML2, "Light

Document ID	Revision	Approval	Date Published
7139	8	Supervising Criminalist - Biology	7/24/2019 9:55:34 AM

Source” – IR, “Filter” – none, “Camera Filter” – IR only IIII. Once the settings selections have been completed in the software, change the filter setting on the camera itself to correspond by looking on the right side of the camera and selecting IR only IIII. When the IR light source button is depressed, the relevant indicator will blink until the key on the back of the main unit is turned horizontally.

- F.6 The intensity of the white light source can be adjusted using the up and down arrow buttons. Press and hold a button to start increasing/decreasing the intensity and release the button to stop. The last intensity value to be used is stored until power is removed from the main unit. The default intensity value is 100%.
- F.7 Using the Crime-lite® ML2 UV, violet, and blue light sources viewing will be directly through the unit itself. Using the Crime-lite® ML2 IR the viewing will be on the monitor via the unit camera. Select “Live” on the upper menu bar. Select “Auto” in the Exposure block to allow for automatic exposure adjustment. The exposure can be changed manually using the “more” or “less” tiles if desired. Scan the evidence by gripping the handles on the sides of the main unit and slowly sweeping the Crime-lite® ML2 over the entire item being careful not to come in contact with the item.
- F.8 Mark stains of interest by encircling the area with a permanent ink marker.
- F.9 For stains visualized using the UV, violet, and blue light sources, photographs of stains can be captured through the central part of the magnifying lens using any camera if desired. For stains visualized using the IR light source, photographs of stains can be captured utilizing the attached camera and Crime-lite® camera software if desired. Select “Grab Image” to capture an image. You may annotate the area in the viewing field before or after the image is captured by selecting the “Annotate” tile. The “Options” tile allows rotation of a captured image. Any grabbed image will be located in C:\CLC Grab Folder where it may be renamed and/or moved. Alternatively, select “Save As” and place in Libraries\Documents\analysts’ individual folder or place onto memory card.
- F.10 Upon completion of the examination, ensure that the key on the back of the main unit is in the vertical position and that all light sources are off. To switch off a light source depress the power/standby button on the top right side of the main unit.
- F.11 After use, clean the Crime-lite® ML2 handles with a 70% ethanol solution or Bleach-based cleaner, e.g. Clorox Bleach Germicidal Cleaner. When necessary use a Kimwipe to remove dust from the magnifying lens and other surfaces on the main unit. If the air filter at the input ventilation port is dirty, replace it by removing the magnetically attached filter grill at the front of the unit.
- F.12 When not in use, cover the Crime-lite® ML2 main unit with its protective case, return viewing filters to their protective sleeves, close the Crime-lite® camera software and turn off the monitor.

## **G. INTERPRETATION GUIDELINES**

Not applicable

Document ID	Revision	Approval	Date Published
7139	8	Supervising Criminalist - Biology	7/24/2019 9:55:34 AM

## H. REFERENCES

- H.1 *Crime-lite® ML2: Forensic Light Source User Manual*, Foster + Freeman Ltd, Worcestershire, UK.
- H.2 Kobus, H.; Silenieks, E.; Scharnberg, J. "Improving the Effectiveness of Fluorescence for the Detection of Semen Stains on Fabrics," *J. Forensic Sci.*, 2002, 47, 1-5.
- H.3 Nelson, D.G.; Santucci, K.A. "An Alternate Light Source to Detect Semen," *Acad. Emerg. Med.* 2002, 9, 1045-1048.
- H.4 Virkler, K.; Lednev, I.K. "Analysis of Body Fluids for Forensic Purposes: From Laboratory Testing to Non-Destructive Rapid Confirmatory Identification at a Crime Scene," *Forensic Sci. Int.* 2009, 188, 1-17.

Document ID	Revision	Approval	Date Published
7139	8	Supervising Criminalist - Biology	7/24/2019 9:55:34 AM

*Printouts of this document may be out of date and should be considered uncontrolled.  
The published version of the document should be viewed on-line in Qualtrax.*